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The purpose of this study was to determine the need for additional graphic arts programs in Utah's public schools and technical colleges. Personal interviews were conducted in 40 plants and 189 questionnaires were mailed, including some to the 40 interviewed plants. The study revealed: (1) a ratio of less than 100 trainee completions to more than 200 estimated job openings, and (2) a lack of production experience on the part of trainees. An analysis of the findings in terms of industry requirements versus school outputs indicate that an expansion of the number of graphic arts courses at the post-secondary level in Utah was desirable. (CH)

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FINAL REPORT
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UTAH GRAPHIC COMMUNICATIONS INDUSTRY SURVEY

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Vocational and Technical Education
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Salt Lake City, Utah 84111

March 1969

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SUMMARY

The primary purpose of this study was to determine the need for additional graphic arts programs in Utah's public schools and technical colleges. Basically the determination was made by comparing the number of entry level workers required by the printing trades of Utah with the output of the schools' graphic arts programs.

An interview guide and a questionnaire were developed, validated, revised, and utilized to gather the data needed. Interviews were conducted in 40 plants and 189 questionnaires were mailed, including some to the 40 interviewed. Telephone calls were made to a randomly selected group of the non-responders. Liaison was established with the Utah State Department of Employment Security to get names of commercial printing establishments and number of workers in the printing trades. A list of industrial plants with separate printing departments ("captive" plants) was obtained from a local distributor of printing supplies. Contact was made with sales representatives of printing equipment manufacturers to obtain information on the rate of sales of printing presses. The data revealed:

a. In 1967 there were 153 separate commercial printing plants in Utah, plus a significant but unknown number of "captive" plants. (page 4)

b. In 1968 there were 1,940 persons employed in printing occupations in the printing industry in Utah. (Page 8, 1,865 + 4%)

c. The attrition rate among people in the printing industry as reported by the survey was approximately 5.5%. (Page 11)

d. The estimated growth (expansion) of the printing industry in Utah in 1969, in terms of full-time employees as shown in the survey was about 6.3%. (Page 11)

e. Based on the responders and extrapolated to represent Utah's total printing industry, 227 new employees (attrition plus growth) would be needed in 1969. (Page 16)

f. The 1968 output of Utah's secondary and post-secondary schools in the graphic arts field (excluding teachers) was 95. (Page 14)

Analyzing the above data in terms of industry requirements versus school outputs, it was concluded that an expansion of the number of graphic arts courses at the post-secondary level in Utah was desirable.

I. INTRODUCTION

Statement of the Problem

It has been reported, although not supported by documentation herein, that there are over 40,000 commercial printing establishments in the United States, employing over a million people. There are also over 130,000 plants with separate printing departments (hereinafter called "captive" plants) in business, industry, and government. (Graphic Communications, copyright 1967. Addressograph-Multigraph Coporation). In Utah, the State Department of Employment Security[1] reported over 153 separate commercial printing establishments employing more than 3,200 persons. Distributors of printing products and services indicated that by 1968 there were more than 1,200 captive plants in Utah employing some 3,000 people.[2] If these estimates are accurate, and the Principal Investigator believes they are, more than 6,000 persons were employed in Utah by the end of 1968 in the graphic communications industry, exclusive of draftsmen.

The equipment needed by schools to support a high quality graphic arts program properly is very expensive and therefore new programs need to be carefully justified before initiation. In addition, many larger printing companies reportedly have hiring policies which tend to preclude the employment of inexperienced personnel; this legislates against the beginner newly graduated from a school's graphic arts program.

In Utah, the public schools, and, more recently, the Utah Technical College, Provo, have addressed requests to the State Board of Education for support in initiating new graphic arts programs.[3] In reinforcement, at a meeting in Salt Lake City, in June 1968, the president of the National Association of Litho Clubs, Ray Geegh, urged vocational education personnel to move into an extended program in graphic arts instruction at both high school and technical (post-high school) levels.[4]

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[1] Annual Report, Statistical Supplement - 1967.

[2] Letters from distributors.

[3] Letters or requests to State School Office

[4] Minutes, Chapter Presentation Meeting, Utah Litho Club, Salt Lake City, June 5, 1968.

At the July meeting of the Printing Industries of Utah, Dr. O. Preston Robinson, Manager of the Deseret News Press, indicated that Utah's graphic communications industry is growing in size and importance, and that sources of qualified printing personnel are limited.[5] Further, in April 1968, industry representatives in a meeting with graphic arts instructors from Utah's high schools suggested the need for the development of a vocational program to start with an overview in junior high school, to continue in high school with beginning skill training, and to culminate at the post-high school level with a greater degree of specialization and an emphasis on performance in an industrial type environment where time and conservation of resources is so important.[6]

Purpose of Study

The purpose of this study is to provide factual documentation and a recommendation for or against providing State support for the establishment of additional graphic arts programs in schools under the jurisdiction of the State Superintendent of Public Instruction.

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[5]Notes of principal investigator, confirmed by Dr. Robinson
[6]Appendix 4

II. METHOD

The research design envisioned the gathering of data through mailed questionnaires from as large a sample of Utah printing firms as possible, supplemented by in-depth interviews with 30 to 40 firms. Once the data had been gathered, it was analyzed manually to determine the number of jobs expected to be available within the next year due to attrition and expansion.

The output of the graphic arts training programs in Utah schools was checked and a comparison made between the quantitiative output of these schools and the numerical requirements of industry for new employees. In addition, comments were solicited on the quality of the graduates of graphic arts courses with respect to entry level employment requirements.

a. Identification of Population and Sample

The Directory of Utah Manufacturers for 1967 - 1968, prepared by the Utah Committee on Industrial and Employment Planning and the Utah State Industrial Promotion Commission in cooperation with the Utah Department of Employment Security, was used to identify the population of commercial printing establishments in the state. Although several of the firms listed were no longer in business or had consolidated with other companies, it is believed that this directory provided a fairly complete list of commercial printing establishments currently in operation.

The commercial printing companies were categorized by number of employees from the listing in the Directory of Utah Manufacturers 1967 - 68 (Code 27 - Printing Publishing and Allied Occupations, pp. 40-43). Selection of firms was made at random to get a cross section of large, medium and small plants located in the major population and industrial area of the state, from Ogden on the north, to Payson on the south. Names of publishers were also selected from other areas of the state for representative coverage. Table 1, following, gives the number of plants by category of employees from the Manufacturers Directory and the sample used in the survey from each category.

Table 1

ANALYSIS SAMPLE OF COMMERCIAL PRINTING EMPLOYERS

Employee Category	Total Number of Plants	Sample	Percent
1-9 Employees	84	10	12.0
10-24 Employees	40	12	30.0
25-99 Employees	23	10	43.5
100-249 Employees	4	2	50.0
250-500 Employees	2	2	100.0
TOTAL	153	36	23.5

Source: Directory of Utah Manufacturers, 1967-68

The Utah Department of Employment Security maintains an occupational index of persons employed in non-agricultural wage and salaried jobs.[1] It seemed infeasible for the scope of this survey to search this index to compile a list of captive plants. Instead, the names of captive plants used in the survey were taken from a mailing list provided by a distributor of printing supplies who volunteered this service. The principal investigator invited other suppliers to provide mailing lists, but none were received. The list used was supplemented by the investigator's knowledge of schools; federal, state, and local industries; public agencies, and churches having printing departments.

Table 2, following, shows the number of captive plants selected in the survey, and the number replying, or contacted by telephone or in person.

Table 2

ANALYSIS OF SURVEY REPORTS OF CAPTIVE PLANTS

Number of Employees	Number Firms Replying	Number Firms Selected in Survey
1 - 9	50	
10-24	4	
25-99	3	
TOTAL	57	93

Number of employed was obtained only from plants replying

The final survey sample was composed of 189 commercial and captive printing establishments. These were chosen at random by geographic location and plant size. Forty firms were chosen for interview on the basis of geographic location and number of employees in relation to total survey area and number of employees involved.

b. Preparation of the Questionnaire and Interview Guide.

The questionnaire was designed to elicit from the responding firms information about present employment, current vacancies, and projections for future job openings; evaluations of graduates of public classes offered in graphic communications; and suggestions for improving or adding to public training in printing occupations. In designing the questionnaire, it was realized that in some firms employees would work in only one occupational classification while in other, primarily the smaller shops, each employee might perform in several occupational areas. To deal with this situation, two sections were built into the questionnaire, and those responding were asked to complete the section which most closely dealt with the circumstances of their own firm. (See Appendix 2)

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[1] Occupational Industrial Matrix - Utah State Department of Employment Security.

A preliminary form of the questionnaire was used as the guide during formal interviews (see Appendix 1). In addition, a list of supplementary questions was prepared by the investigator to outline those areas which the interviewers should probe in depth (see Appendix 3).

c. Training of Interviewers

The interviewers, who were RCU staff members, attended a two-hour briefing session during which background information on the printing industry was presented by the investigator, the purpose of the survey was explained, and the interview guide was reviewed for clarification purposes. In addition, the group visited a large commercial printing firm in Salt Lake City (Deseret News Press) for the purpose of observing and becoming familiar with printing processes.

d. Validation of Questionnaire

The survey design called for validation of the questionnaire by mailing the proposed questionnaire to a sample of 10 firms from the list of printing establishments. However, only 4 of the 10 were returned, forcing the investigator to rely primarily upon the interview results and feedback from the interviewers to supplement the validation sample in validating the questionnaire. Revisions suggested by these sources were made in designing the final questionnaire.

e. Response to Questionnaire

From the original mailing of 185 questionnaires, replies were received from 14 commercial and 4 captive plants. Seven questionnaires were returned marked "Moved, left no forwarding address." Of these, three were located through telephone inquiry, having relocated, consolidated with other firms, or taken new names. Four were no longer in operation or had moved outside the state. Two and a half weeks after the initial mailout, follow-up letters were sent to 144 firms which had not reported or had the first letter returned. Questionable names or addresses caused elimination of 16. The follow-up brought one reply from a captive plant and 4 from commercial plants. Two letters were returned from captive plants,.stating the senders did not meet the requirements of the survey.

f. Technique for Sampling Non-responders

Because of the small number of firms responding to the mailout questionnaire, it was deemed advisable to supplement the mail returns by telephone contacts with plants from which questionnaires had not been received. The investigator contacted a total of 33 captive and commercial printing establishments. The items on the questionnaire were repeated over the telephone, and in addition, the investigator informally interviewed the responders to obtain additional supportive information. The results of the telephone survey agreed with the response pattern obtained from the interviews and from the mailout questionnaires.

g. Sources of School Data

In order to determine the number of students completing public training courses in graphic communications occupations in Utah annually, the schools offering these courses were contacted by the investigator. The registrar of the Utah Technical College at Salt Lake supplied copies of the official graduation lists which indicated the number of completions per academic year. The instructors of the remaining classes were contacted individually since graduation lists from their schools did not indicate occupational areas. These were the instructors from Brigham Young University, Provo High School, and the Granite School District Media Center.

h. Other Sources of Data

1. Since it was felt that the response from mailout questionnaires was less than desirable and the interviews and telephone sampling did not give sufficient coverage of the occupations, the investigator went to the Utah Department of Employment Security to secure occupational data available for printing occupations. Richard J. Arnold, Chief Statistician for the Utah office, supplied data from the Occupational Industrial Matrix for 1967.[1] Table 3, following, gives the employment data for Printing, Publishing and Allied Occupations for 1967, the table shows also the Employment Service's projections of numbers in these occupations in 1975, based on past reports and general economic growth predictions in use by the Department. This table shows employment by occupation without respect to type of employer, and thus includes both commercial and captive plant figures. The table shows only numbers employed in actual printing job titles, not the total employees of the company reporting. It includes seasonal and part-time workers, adjusted to full time equivalents.

2. The investigator contacted in person managers or sales representatives of four major distributors of printing equipment, supplies and services. Two questions were asked: "How many clients do you have in Utah whom you service regularly?" and, "When you visit your customers, do you find a need for persons qualified in printing occupations?" The replies revealed that more than 2,000 offset presses and associated equipment are in use in Utah in captive plants, (business, public and other agencies), and additional installations in largely new companies were made during 1968 at the rate of 15 or more per month. The replies indicated also that a continuing need exists for qualified persons in printing occupations, more noticeably in offset press occupations.

The investigator observed that the need expressed by sales representatives gave emphasis to "qualified" persons, and that entry workers, inexperienced persons, were not hired in equal numbers.

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[1]See page 5

Table 3

1967 EMPLOYMENT IN PRINTING OCCUPATIONS,
AND EMPLOYMENT PROJECTIONS TO 1975
UTAH STATE DEPARTMENT OF EMPLOYMENT SECURITY

Occupational Title*	1967 Employment	1975 Projection
Binder	221	304
Compositor	665	910
Cylinder Press Feeder	5	7
Cylinder Press Man	36	61
Duplicator Operator	159	199
Electrotype Operator	29	40
Estimator	2	3
Etcher	24	
Flexographic Pressman	17	23
Folder	103	131
Folding Machine Operator	11	15
Linotype Operator	29	40
Lithographer	10	9
Offset Duplicator Operator	93	121
Offset Press Man	192	254
Offset Press Operator	4	7
Paste-up Man	2	2
Photo Engraver	1	1
Photo Lithographer	15	20
Photographer-Photo Engraving (Cameraman)	20	25
Platen Press Man	5	7
Stitcher	36	50
Supervisor	10	12
Varitype Operator	1	1
Webb Press Man	112	154
Webb Press Man Apprentice	99	54
TOTALS	1,865	2,476

Percent of increase per year: 4.0

*Titles are taken from the Dictionary of Occupational Titles. Numbers employed are adjusted for part-time and seasonal employment.

3. Representatives of three professional groups in graphic arts affirmed to the investigator earlier statements made regarding need for more education and training in printing occupations. These were statements which appeared in a seminar report. (See Appendix 4, p. 29)

4. Mr. Glen M. Larsen and L. R. Johnson, business representatives of the Typographers Union Local 115 and the Allied Printing Trades Council, were contacted for labor's expression of training needs. Both supported the industry stand that industrial arts exploratory and pre-apprentice training classes are needed to provide increased sources of new employees. The typographers' representative pointed out that "old line printers" are reaching retirement age in larger numbers than youthful replacements are being supplied. (See Appendix 4, p. 29)

The Allied Printing Trades Council also supplied data on the number of apprentices in training in printing trades during 1968-69. These figures supplemented data on graduates of public school courses to determine the total number of trained entry workers available.

III. SURVEY FINDINGS

The total questionnaires processed are summarized in Table 4.

Table 4

TOTAL QUESTIONNAIRE PROCESSED
COMMERCIAL AND CAPTIVE PLANTS

Personal Interview		Telephone		Mail	
Commercial	Captive	Commercial	Captive	Commercial	Captive
19	21	2	31	18	5
	40		33		23
			96		

Total Commercial	39	Total Captive	57
Percent	25.5	Percent	?

Table 5, p. 11, is a tabulation of information on employment, expansion, attrition, and printing students employed. When adjusted for part-time and seasonal employees, on a ratio of 4 seasonal employees to one full time employee (a ratio comparable to that used in the Occupational Industrial Matrix[1] in computing numbers employed by occupation) it was found that 1,628 persons are employed by companies reporting in the survey sample. The table also shows an expected increase during 1969 of 102 employees in the companies reporting, and an actual attrition during 1968 of 89 employees. Table 5 differs from Table 3 (p.8) in that it is the tabulation of employees, attrition and expansion, etc., reported in 1968 by employers replying to questionnaires and interviews, while Table 3 is the summary of reports to the Department of Employment Security in 1967.

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[1] Page 5

Table 5

ANALYSIS OF EMPLOYMENT EXPANSION, ATTRITION AND NUMBER OF PRINTING STUDENTS EMPLOYED IN RCU SAMPLE OF PRINTING INDUSTRY

December 1968

Employed				Projected Expansion 69		Attrition 68		Students Employed	
Commercial		Captive							
F.-Time	Seasonal	F.-Time	Seasonal	Comm.	Capt.	Comm.	Capt.	Comm.	Capt.
1334	68	294	105	91	11	74	15	35	24
1628				102		89		59	

Attrition Rate 5.5%

Expansion Rate 6.3%

Table 6, p. 12, compares job titles of the Dictionary of Occupational Titles used by the Department of Employment Security with those reported in the Survey.

Table 7, p. 13, is a tabulation of the number of companies reporting the employment of printing class trainees or graduates - together with their evaluation of the training at entry into employment.

Table 8, p. 13, shows the number of commercial and captive plants which reported affirmatively to the question, "Will you consider entering into cooperative training with the public schools." In the interviews and telephone contacts the problem of cooperative training was discussed to the point of understanding. It is reasonable to expect that with proper introduction and planning, a substantial number of high school students and technical college trainees can be placed in cooperative situations either for the entire training program or in the latter stages of the course.

Table 6

COMPARISON OF OCCUPATIONAL TITLES:
STATE EMPLOYMENT SERVICE AND RCU SAMPLE SURVEY

Employment Service Report Occupational Title	RCU Survey Occupational Title
Binder	Binder
Compositor	Compositor
Cylinder Press Feeder	
Cylinder Press Man	Rotary Press Man
Duplicator Operator	Duplicator Operator
Electrotype Operator	Cold Type Compositor
Estimator	Estimator
Etcher	Etcher
Etcher Apprentice	
Flexographic Pressman	
Folder	Folder
Folding Machine Operator	
Linotype Operator	Linotype Operator
Lithographer	
Offset Duplicator Operator	
Offset Press Man	Offset Press Man
Offset Press Operator	
Paste-Up Man	Paste-Up Man
Photo Engraver	Photo Engraver
Photo Lithographer	
Photographer-Photo Engraving (Camera Man)	Cameraman
Platen Press Man	Letter Press Operator
Stitcher	Stitcher
Supervisor	Supervisor
Varitype Operator	Varitype Operator
Webb Press Man	Webb Press Man
Webb Press Apprentice	
	Layout Man
	Make-Up Man
	Stereotype Operator
	Cutter
	Service Mechanic
	Sewer
	Miscellaneous

Table 7

FORMER TRAINEES OF PRINTING CLASSES EMPLOYED BY COMPANIES REPORTING IN PRINTING SURVEY AND QUALITY OF TRAINING

	Comm. Plants	Captive Plants	Total
Number of Trainees Employed	35	24	59

NUMBER OF PLANTS REPORTING ON QUALITY OF TRAINING

Quality	Comm. Plants	Captive Plants	Total
Well Trained	1	4	5
Fairly Well Trained	8	9	17
Poorly Trained	5	5	10

Table 8

NUMBER OF COMPANIES APPROVING THE PRINCIPLE OF COOPERATIVE TRAINING

Total number firms answering question	93
No. commercial plants approving coop. training	16
No. captive plants approving coop. training	8

The approving plants indicated interest in, and willingness to investigate and/or join in cooperative training programs.

Table 9 is a tabulation of graduates and completions in printing occupations from the four schools reporting vocational training classes in the printing field. Brigham Young University has the oldest training program in this area, but directs its major effort to the training of instructors rather than printing technicians or vocational printers.

Table 9

COMPLETIONS IN TRAINING CLASSES FOR PRINTING OCCUPATIONS IN UTAH SCHOOLS AND COLLEGES

School	1966	1967	1968
Brigham Young University	8	10	6
Granite District Media Center	-	--	5
Provo High School	4	6	6
Utah Technical College, Salt Lake	20	17	78
TOTALS	32	33	95

Table 10, below, shows the number of recognized apprentices in shops reported by the Allied Printing Trades Council in 1968-69. The small number in training, 6 per year completing, means that this program has little effect on the number of trained entry workers available for placement annually.

Table 10

APPRENTICES IN TRAINING 1968-1969

Typographers	8	Stereotypers	2
Lithographers	6	Fly Binders	2
Webb Pressmen	5	Mailers	1
TOTAL ENROLLED		24	
AVERAGE COMPLETIONS PER YEAR		6	

SOURCE: Allied Printing Trades Council

Table 11

INDICATED TRAINING NEED AND SUGGESTED SCHOOL TRAINING AREAS

These are subject areas in which industry has indicated need for more instruction in pre-employment and/or occupational extension courses. Table also indicates related subject areas in which schools can give instruction.

Occupational Titles	Training Need	School Instruction
Composition		
Compositor	x	x
Justowriter Operator	x	
Linotype Operator	x	x
Varitype Operator	x	x
Electrotype Operator	x	
Layout Man (Makeup Man)	x	x
Paste-Up Man	x	x
Litho-Preparation		
Cameraman	x	x
Stripper	x	x
Platemaker	x	x
Press Man		
Duplicator Operator	x	x
Letter Press	x	x
Offset Pressman	x	x
Webb Piessman	x	
Bindery		
Folder	x	x
Cutter	x	x
Stitcher	x	x
Binder	x	x
Other Training Areas		
Service Mechanic	x	x
Sterotype Operator	x	x
Shop Supervisor	x	
Estimator	x	x
Commercial Artist	x	x
Draftsman	x	x
Related Subjects		
Grammar	x	x
Spelling	x	x
Punctuation	x	x
Materials handling	x	x
Kinds of Paper, Costs	x	x
Printing Costs and Economy	x	x
Public Relations	x	x
Production Standards	x	x
Quality Control	x	x
Typing	x	x

IV. ANALYSIS OF DATA

The base figures used to evaluate the survey and draw conclusions were those from the table of employment by occupation provided by the Utah State Department of Employment Security (Table 3) and the rate of increase (4% per year) in employment projected in this table.

From this table, 1968 employment was projected -

$$\frac{\text{1967 Employment}}{1865} + \frac{\text{Projected Increase}}{(1865 \times .040)} = \frac{\text{1968 Employment}}{1940}$$

This 1968 employment total, 1940, was compared to the total employment derived from the survey. It was found that the survey covered 83.9% of the total projected employment figure -

$$\frac{1628}{1940} = 83.9\%$$

Using this figure, (83.9%), expansion and attrition figures reported in the survey (Table 5) were adjusted to show total expansion and total attrition, Table 11.

Table 12

ATTRITION AND EXPANSION REPORTED IN RCU SURVEY ADJUSTED USING 83.9% RATIO OF SURVEY TO TOTAL

	Attrition		Expansion		Total Job Openings
	Comm.	Captive	Comm.	Captive	All Plants
Reported	74	15	91	11	191
Adjusted	88	18	108	13	227
Totals	106		121		

These figures were checked by Richard J. Arnold, Chief Statistician, State Department of Employment Security and found to be consistent with the records of the Department as to total job openings. It was noted that attrition reported in the survey tended to be conservative and expansion tended to be generous when compared to reports of employers to the Department of Employment Security. The survey appears to indicate (confirmed by Employment Security ratios) that the job estimate of 227 in graphic arts occupations for 1969 is reasonable and that expansion in the next few years will be more likely to increase than to remain constant or decrease, and that attrition is not likely to decrease. Training needs are likely to expand. Opinions of employers as reported in the survey questionnaires express the need for more intensified training.

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. There appears to be reasonable basis for development of a second vocational-technical program in Graphic Communication at the post secondary level in Utah schools. The ratio of less than 100 trainee completions to more than 200 estimated job openings indicates a gap which can provide justifiable increase in provision for training. Apprentice training in printing occupations in Utah at present does not contribute sufficient new workers in the field to bridge the job gap. The alternative is to increase the effectiveness of pre-employment training.

2. Replies to questionnaires and interviews give strong evidence of the need to increase the production effectiveness of Graphic Arts programs. There is general agreement that basic theory training and knowledge of processes is satisfactory, but trainees tend to lack production experience and initiative to take assigned projects and move them to completion. This is due in part to lack of a sufficient quantitiy and size of equipment for production training in the newest printing processes. In part it is because trainees do not stay in the courses long enough and apply themselves sufficiently to gain production technique and speed.

3. There is evidence in the questionnaires returned and interviews reported that closer relationships with the industry need to be developed. Many employers are not familiar with the training programs and laboratories in the schools and are not using the graduates of these courses. Some have had unsatisfactory experiences with former printing trainees who have not had sufficient training to succeed in the employer's operation.

4. The expressed need to extend the teaching of graphic arts in the high schools can not be ignored. Both employers and labor leaders emphasized that the dearth of qualified craftsmen in the printing occupations today is due in part to lack of knowledge, experience and understanding of the graphic communication industry on the parts of youth, counselors and school administrators. Where exploratory and pre-vocational experience in graphic arts are lacking among youth there are few who learn of job opportunities.

5. There is evidence in the survey replies to indicate readiness on the part of the printing industry to investigate and join in cooperative training in printing occupations, with the objective of increasing on-the-job training situations.

Recommendations

1. It is recommended that administrators and advisory committees of present graphic arts programs review curricula, equipment, facilities and instruction critically with the view toward increasing effectiveness of the training, promoting closer relations with the industry, and maintaining relations with the industry and maintaining retention of trainees to the completion of courses. To the extent possible in the public school situation, production type projects should be increased, opportunity for specialization in particular jobs in the occupation should be emphasized and industry production time standards and techniques should be approached. Trainees nearing the completion of courses should meet time and quality standards of the industry.

2. A plan and time schedule should be set up to initiate a second vocational-technical course in Graphic Communication at a location to be determined by the State Board for Vocational Education. An advisory committee should guide the project. It should be implemented with facility, equipment, curricula and personnel of a type and quality to provide instruction in the newest processes, techniques and procedures that can be provided reasonably within the budget limitations of the agencies concerned. It should be put into service at a quality level to attract support from the industry both in endorsement and in utilization of the product.

3. Vocational education administrators should close the employment gap with industry by promoting and initiating cooperative training - employment programs, where trainees in printing courses may spend half or more of their time in employment during the final periods of their courses. Or, co-op type courses should be organized where trainees may learn their skills on the job while attending school classes to complete their education.

4. A movement should be initiated to increase the effectiveness and expand the number of industrial arts offerings in graphic arts in the high schools, with the objective of guidance in vocations and awareness and understanding of the significance of the industry in the economy and on the lives of people.

Name of Firm_____ Address_____

Number of Employees_____ Date_____ _____

IF EACH EMPLOYEE IN YOUR FIRM WORKS IN ONLY ONE OCCUPATIONA AREA, ANSWER PARTS I AND III OF THIS QUESTIONNAIRE. IF EACH OF THE EMPLOYEES OF YOUR FIRM WORKS IN SEVERAL OCCUPATIONAL AREAS, ANSWER PARTS II AND III OF THIS QUESTIONNAIRE. PLEASE RETURN THIS QUESTIONNAIRE BY NOVEMBER 15.

PART I

Occupational or Payroll Areas	Number of Persons employed in each area	Number of Vacancies in each area at present	How many additional full-time workers do you expect to need in the coming year in each area	If you employ seasonal workers, indicate the number employed in each area	Estimate your average annual turnover in full-time employees in each area.
1. Composition					
2. Photo Engraving					
3. Electrotyping					
4. Stereotyping					
5. Letter Press Op.					
6. Offset Press Op.					
7. Linotyping					
8. Lithographing					
9. Bindery					

PART II

1. Check below the areas in which employees in your firm work:

_____composition

_____photoengraving

_____electrotyping

_____stereotyping

_____ letter press operator

_____off-set press operator

_____linotyping

_____lithographing

_____bindery

2. Indicate the total number of vacancies in your firm at present _____

3. Indicate the total number of additional full-time employees you expect to need in the coming year:

_____

4. Indicate the number of seasonal workers employed by your firm:_____

5. Estimate your average annual turnover of full-time employees:_____

PART III

1. Approximately how many applicants for skilled jobs were not hired during the past year due to lack of skill: _____

_____ (number)

2. How many former students of Utah printing classes have you employed during the past three years?

_____ yes or no

Were these entry-level workers?

Did you consider them:

_____ well trained
_____ fairly well trained
_____ poorly trained

Will you comment on the weaknesses or gaps in their training?_____

_____

_____

_____

3. Please indicate the changes you would suggest in public training for the graphic communications industry.
Please be specific:

4. Please name specific jobs or payroll titles in the graphic communications field for which you think the schools can give satisfactory training for entry workers:

5. In what jobs or payroll titles do you feel the schools can give effective extension or upgrading instruction?

_____ 6. Will you consider entering into a cooperative training program with a public school in your community to prepare skilled workers in graphic communication occupations, where students may attend school one half day and be employed one half day through the training program?

GRAPHIC ARTS SURVEY

Name Of Firm_____Address_____

Date_____Total Number of Employees in Printing Occupations_____

IF EACH EMPLOYEE IN THE PRINTING AREA WORKS IN ONLY ONE JOB, ANSWER PARTS I AND III OF THIS QUESTIONNAIRE
IF PRINTING EMPLOYEES WORK IN SEVERAL JOBS, ANSWER PARTS II AND III OF THIS QUESTIONNAIRE

PART I

Occupational or Payroll Areas	Number of Persons employed in each area	Number of Vacancies in each area at present	How many additional full-time workers do you expect to need in the coming year in each area	If you employ seasonal workers, indicate the number employed in each area	Estimate your average annual turnover in full-time employees in each area
1. Composition Hand Compositor Linotypist Make-up Man Paste-up Man					
2. Litho-Preparation Camera Man Stripper Plate Maker					
3. Pressman Duplicator Operator Platen Pressman Cylinder Pressman Offset Pressman					
4. Bindery Folder Cutter Stitcher, Hand Stitcher-Trimmer Binder					
5. Other (Please List Occupations) _____ _____ _____					

PART II

1. Check below the areas in which employees in your firm work:

Composition
_____Hand Compositor
_____Linotypist
_____Make-up Man
_____Paste-up Man

Litho Preparation
_____Cameraman
_____Stripper
_____Plate Maker

Pressman
_____Duplicator Operator
_____Platen Pressman
_____Cylinder Pressman
_____Offset Pressman

Bindery
_____Folder
_____Cutter
_____Stitcher, Hand
_____Stitcher-Trimmer
_____Binder

Other (Please list Job Titles)
_____
_____
_____
_____
_____
_____
_____
_____

2. Indicate the total number of vacancies in your firm at present_____.

3. Indicate the total number of additional full-time employees you expect to need in the coming year:

_____

4. Indicate the number of seasonal or part-time workers employed by your firm:_____.

5. Estimate your average annual turnover of full-time employees (number):_____.

PART III

1. Approximately how many applicants for skilled jobs were not hired during the past year due to lack of skill:_____.

_____ number
2. How many former students of Utah printing classes have you employed during the past three years?

_____ yes or no
Were these beginning workers?

Did you consider them:

_____ well trained
_____ fairly well trained
_____ poorly trained

Will you comment on the weaknesses or gaps in their training?_____
_____
_____
_____

3. Please name specific jobs or payroll titles in the printing field for which you think the schools can give satisfactory training for beginning workers:

_____ _____

_____ _____

_____ _____

_____ _____

4. In what jobs or payroll titles do you feel the schools can give effective upgrading instruction?

_____ _____

_____ _____

_____ _____

_____ _____

5. Will you state briefly your evaluation of present vocational training in graphic arts.

_____ _____

_____ _____

_____ _____

_____ _____

6. There is indication among members of the printing industry that cooperative-type training programs for printing occupations should be introduced in Utah. In these programs students attend school a half day and work in printing jobs a half day. The schools give the instruction, in courses outlined and planned with representatives of industry, and supervise the overall program. Individual plants in the industry employ the students at pay rates consistent with their learner status, and provide them the on-the-job training and guidance needed to gain skills in standard occupations of the industry. Federal and State safety laws and special orders provide that learners under properly supervised instruction may work around or with moving equipment in a planned vocational program.

a. Do you feel this type of training program should be promoted? Will you support and participate in this kind of instruction to increase availability of trained workers?

_____

_____

_____

_____

7. Comments:

SUGGESTED JOB AREAS TO EXPLORE AND SOME QUESTIONS TO ASK:

1. People in the graphic arts and printing industry frequently say there is almost an explosion of new methods, processes, employment demands, etc., in the field. They speak of great increases in the numbers and kinds of sheets, pamphlets, books and magazines printed and sold and a vast expansion of paper used in publishing, record making, computer activities, etc. Yet no one seems over-anxious to hire young people with high school or post-secondary school foundation and/or special course work in graphic arts.

a. In what new directions should the public schools move to keep current with the developments in the graphics field?

b. Should more high schools initiate vocational courses in graphic arts, where basic printing skills and knowledge are studied?

c. Should the technical and junior colleges start more occupational courses in printing fields?

d. What are the skills entering workers should have?

e. Please name the kinds of payroll jobs printing class graduates may expect, in commercial plants, in captive plants?

f. What minimum training will be effective in operating commercial equipment?

g. How much training and experience should persons receive before they may expect work as regular employees at skilled worker levels?

h. For which jobs in the printing industry are there labor shortages? Please name them. Are any of these seasonal?

i. What are your sources of skilled workers? Are trainees or graduates from the public school programs finding employment in your plant? Are more needed?

j. Can the public schools provide (more) instruction to upgrade workers in printing fields?

k. What specific types of machines should the schools install to give the kinds of basic training to shorten break-in time of new workers?

2. There is indication among members of the printing industry that cooperative type training programs for printing occupations should be introduced in Utah. In these programs students attend school a half day and work in printing jobs a half day. The schools give the instruction in courses outlined and planned with representatives of industry, and supervise the overall program. Individual plants in the industry employ the students at pay rates consistent with their learner status, and provide them the on-the-job training and guidance needed to gain skills in standard occupations of the industry. Federal and State safety laws and special orders provide that learners under properly supervised instruction may work around or with moving equipment in a planned vocational program.

a. Do you feel this type of training program should be promoted? Will you support and participate in this kind of instruction to increase availability of trained workers?

PRINTING CURRICULUM DEVELOPMENT

As part of a project to conduct Saturday seminars in occupational areas for high school teachers, a seminar was held Saturday, April 20, 1968 at Hillcrest High School for instructors in Graphic Arts. Instructors invited were:

John Querry
Kearns High School

Glade C. Bailey
Hillcrest High School

David H. Harmon
Provo High School

Gordon L. Weight
Utah Technical College
Salt Lake

In preparation for the seminar, invitation was given to representatives of the printing industry and to others concerned with the Graphic Arts field to participate as consultants. The following attended:

Keith Loosli
University of Utah Printing Serv.
Chairman of the Advisory Committee
Utah Technical College at S. L.

Mike Lawyer
Gans Ink Company

LeRoy DeKarver, Superintendent
Deseret News Press

William Swatscheno
Gans Ink Company

Miss Jean Schonka
Printing Instructor
Intermountain School
Brigham City, Utah

Rhonda Jenkins, Head
Graphic Arts Department
Brigham Young University

Gary Jones
Instructor in Graphic Arts
Utah State University

Dr. Neill C. Slack, Head
Industrial & Technical Ed. Dept.

Glen M. Larsen, Secretary
Utah Printing Trades Council

Fred W. Bittner, Owner-Manager
Printing, Inc.

Two main objectives were set for the seminar:

1. To acquaint the instructors more directly with the needs and developments of the Graphic Arts industry.

2. To relate the instruction program more closely to industry needs and to lay foundation for development of a more functional curriculum for teaching Graphic Arts.

Discussion was held in which the industry representatives spoke effectively on the developments and expansion of printing industry in this state. It was pointed out that there are twelve-hundred or more printing plants along the Wasatch Front. These include commercial printers, captive printing plants, school plants, individually owned job plants and equipment installed in private offices used more than for office correspondence. These provide opportunity for employment at the skilled and semi-skilled operator level in the processes involved in printing of newspapers, magazines and advertising today.

Minutes of this meeting, which are attached, indicate the feelings of the representatives at this meeting as to the necessity for expansion and development of the Graphic Arts program in Utah public schools. Attached also, is a statement provided by Professor Rhonda Jenkins of the Brigham Young University, explaining further his feelings on the development of a program from his experiences as a member of the International Graphic Arts Association.

The following questions were posed to the group:

1. Are Utah Industries being serviced adequately through present training and employment resources?

2. Do employment projections and industry expansion present an outlook toward increased employment and need for expanding courses in preparatory or entry training into these occupations.

3. What should the public schools be doing to provide better communication services for industry and the public?

4. How can industry and the schools work together to build an efficient visual communications program that will reach statewide and provide the understandings and the services necessary for Utah's continued growth in this field?

The group discussed these questions at three levels: First, what should be done to lay a foundation for the public in general, for employers and for the training of persons to go into the visual communications industry? What courses should be taught? To what extent should graphic arts information be extended downward into the elementary grades?

The committee then discussed what should be done in the junior high schools and senior high schools in this field. Should there be pre-vocational, pre-apprentice, and occupational preparatory training? Or should it be limited to industrial arts and the specialized courses be offered later?

Discussion followed on the occupational training curriculum that should be offered after high school and its relationship to the professional training courses for teachers in visual communication.

The following conclusions and recommendations were reached at this discussion:

1. The terms "Graphic Arts", "Visual Communication", "Printing", are generally similar in meaning and for this discussion Graphic Arts is a suitable term. A definition might be "the development and method of recording information in a visible form that can be retrieved non-destructively at any time by an observer using light and his vision".

2. Graphic Arts instruction should begin as part of a planned curricula in elementary schools, to give children a beginning understanding and experience with visual communication as the basic foundation upon which civilization is built. The subject matter should enrich all their studies through development of an awareness that learning comes through seeing, hearing and touch. There should be continuous interpretation of graphic presentation in all school experience.

3. In the high school, exploration and applied experience should begin in the seventh grade with varied activities in the Graphic Arts. Occupational implications should be developed. As many visual media as possible should be explored and tried. In the eleventh and twelfth grades, vocational and pre-employment instruction should be provided and specific vocational guidance provided. All youth should have opportunity to engage in meaningful experiences according to choice.

4. At the technical level (post high school) occupational and technical instruction should be provided in a curriculum designed to provide entry skills and sound, up-to-date technical knowledge. At least two years of schooling should be provided with close contact to industry through active advisory committees, current occupational information, up-to-date equipment and processes. There should be frequent trips into printing plants, cooperative training arrangements, apprenticeships, work-study programs, instructor-industry exchanges and other means of inter-relating instruction and work-experience.

5. Subject and course areas at each level of instruction should include:

   a. <u>Elementary</u>
   Linoleum block printing, potato print on fabric, silk screen, stencil printing photography, poster making, etc. These should be interwoven with geography, history, social study, language, writing.

b. High School

Printing	Typing	Writing
Drawing	Commercial Arts	Spelling
Photography	Advertising	Television
Journalism		

Avenues of learning should include:

School paper	Work-study programs
Radio-T.V. programs	Field trips
Industrial Arts classes	Journalism clubs
Cooperative classes	Photography clubs

Vocational Instruction

c. Post High School - Technical School

Occupational and technical curricula based on analysis of the entire cluster of visual communication occupations:

Typing	Spelling	Grammar
Offset Printing	Journalism	Photography
Plate Making	Lithography	Advertising
Cold-type Composition	Applied Electronics	Computer Programming
Human Relations	Industrial Psychology	
Color Processing	Inks	Television
Book Binding	Accounting	Machine Maintenance
Cost Estimating		Salesmanship

d. The professional levels of the industry may be provided at college and university levels in:

Management	Art
Professional Journalism	Technical Writing
Photography	Advertising
Teacher Education	Specialized study

6. It is recommended that an advisory or consulting committee of educators and industry representatives be organized and a concerted effort be made to develop a plan for introducing, upgrading and expanding graphic arts instruction in Utah.

-That there be expansion and development in the elementary-secondary schools, to provide all children an opportunity to learn of the visual communication media surrounding them and its place in their lives and studies.

-That all youth in junior and senior high schools be enabled to explore and experience as many forms of visual communication as possible and those interested receive guidance, training and experience in graphic arts.

-That occupational and technical instruction be expanded, plants equipped with modern equipment, school-industry relationships and cooperation strengthened.

-That the avenues of work-study, cooperative training, apprenticeship and internship be explored and developed between schools and the industry.

-That educators become more aware of rapidly changing nature of visual media and services available to schools through the graphic arts industry and increase their efforts to relate instruction closely with the new materials, processes, media and services.

NOTES FROM PROFESSOR JENKINS

Professor Ron Jenkins, Head of the Printing Department in the College of Industrial and Technical Education at Brigham Young University, indicated that as a member of the International Graphic Arts Education Association, and one of its directors, he has learned that the printing industry, nationally, suffers from a great shortage of trained, interested, and qualified personnel. According to a recent study made by the Printing Industry of America, almost double the number of apprentices now in training will be needed in the industry merely to replace the men who will move on before the present class of apprentices is graduated. In attendance at a national convention of this organization he learned that Utah was one of the few states which does not have a state program in graphic arts training. Brigham Young University at that time had the only program in operation in the State.

Professor Jenkins pointed out that there are several phases or levels of instruction in the graphic arts program. These begin with the key punch operator in the computerized printing process and extend through all the levels and varieties of skill in the total visual communication field; Typography, plate making, offset press, hand and machine composition, letterpress printing, silk screen printing, printing plant management, on through to the teacher and the teacher trainer in the graphic arts fields. Utah is one of the lowest states in production of this type of personnel. Printing and the Graphic Arts is a completely new industry today due to the new technological advances acquired in the last few years, such as photography, physics, chemistry, electronics, mathematics, and mechanical engineering, he pointed out. Students should take classes in all of these areas in the two-year program, as well as getting practical experience on all the latest graphic arts equipment.

NOTES FROM THE HIGH SCHOOL INSTRUCTOR SEMINAR ON GRAPHIC ARTS

"Mr. Larsen stated in substance that the present training programs in the printing trades were not extensive enough to give entry employment in the commercial printing plants represented by his organization. He indicated that students seeking employment should apply as apprentices rather than ask for positions as beginning workers in the occupation. He reported that there are six plants in Utah large enough to be considered capable of training apprentices. Two of these are represented by Typographers Union.

"He said that you would find, in many of the commercial and captive printing plants in Salt Lake Valley, students of Mr. Astle. He indicated that there are job possibilities for students in captive plants where duplication work, offset press work and work not requiring the standards of quality that commercial plants must produce is available. He urged that students interested in entering the printing field get a good foundation in school, then apply for apprenticeships. In this way they get the best the industry has in preparation and experience.

"Mr. LeRoy DeKarver, Superintendent of the Deseret News Press indicated that companies are very much interested in the development and promotion of printing instruction in Utah. His plant employs over a hundred people; they hire an average of one to five each week, though some stay only a short time. There is always opportunity for the person who has some skill and interest in developing himself in "on-the-job-training". He indicated that the school training programs should extend their operations into the more commercial types of printing-that young people have tremendous opportunities if they have skill and interest and are willing to begin in the industry and work up.

"Mr. DeKarver stated that the Utah Chapter of the Printing Industries Association of America is interested in promoting the graphic arts program in all its phases, particularly with reference to the printing occupations. The Printing Industries Association has proposed a plan of "on-the-job-training" to increase the number of persons available in the industry and to upgrade the quality of employees. The organization in Utah has plans to implement this type of program. He indicated that the printing industry supports the graphic arts program wherever it is found and that he is greatly interested in the development of instructional materials and the organization of classes in this field.

"It was indicated by industry representatives in the group that the modern tendency is for students to lack responsibility toward an employer. It is difficult under the pressures of today for employers to spend the time necessary to train new workers, particularly to develop attitudes of cooperation, loyalty, and willingness to exert themselves in the promotion of their jobs. This is an area in which the schools could do an excellent job and in which they should put much greater emphasis.

"Gordon Weight, Head of the Printing Department at Utah Technical College at Salt Lake indicated that there are 1200 captive printing plants in the Salt Lake Valley area and that 90 students out of 100 who graduate from a printing program, or have experience in it, go to work in the captive plants-too often in limited growth situations.

"Mr. Weight indicated that since its initiation the printing program at Utah Technical College has graduated 156 students from its courses. Of these, only 43 have gone into commercial plants. The course at the Technical College is a one-year program, 1080 hours. The greatest problem is keeping students until they complete the course. Those who do, find employment in all states in the west, many go to the west coast. He indicated the college is considering the extension of printing classes to a two-year program in which an associate degree is possible as well as a certificate of completion in the vocational course. Their problem is lack of commercial type equipment to give the kinds and the quality of instruction necessary for students to enter the industry at a satisfying level."

Each of the high school printing instructors reported briefly on the program he has in operation. Only one of the four instructors in the seminar indicated that he had sufficient equipment to give any instruction on hand composition or platen press operation. The others were all equipped only for offset duplication. Each reported that the major problem in this course is having sufficient time for students to work on the fundamental skills and principles of the occupation. A great deal of time was expended doing routine printing jobs for the school or school district.

Several recommendations were made by members of the group.

1. Interest in the printing occupations should be stimulated by beginning courses in graphic arts at the junior high school level. The steps in the advancement program should be exploratory courses in junior high school, graphic arts courses of industrial arts and vocational nature in the high schools, technical and advanced printing instruction at the Technical Colleges and Junior Colleges. There should be university training and education in the printing industry, for those who would teach or who would go into industry to learn the occupation in all its phases.

2. There should be a co-op program developed which will enable students interested in the printing industry to get occupational experience or on-the-job-training along with their education in this field. Industry and education should cooperate in the promotion and development of a program which will provide replacements in the industry.

3. Interest in entering the occupation through the apprenticeship program should be stimulated and apprenticeship should be explained to youth and the public.

4. There is a lamentable lack of interest and information about the whole field of visual communication in the schools of the state. Means should be developed to provide information and develop interest and motivation in administrators and students to look more carefully into the field of graphic arts, printing or visual communication as it is becoming known, so that instruction can be promoted, programs developed and persons prepared to enter this rapidly growing phase of the economy. While it was pointed out that computerization of many phases of the printing industry seems to eliminate traditional skills of the printing field, this is not entirely true. The total field of visual communication is expanding rapidly and the number of printing units in operation necessitates a vast increase in the number of people trained to do quality work.

5. Public schools should plan, budget for and develop a coordinated graphic arts program which will move in the direction of overcoming the shortages in personnel available in this field. A curriculum should be developed which, as has been indicated before, will provide levels of instruction and opportunities for training for people to go into employment at several levels in the printing industry. Efforts should be made to extend the number of printing classes available in high schools and the amount of graphic arts training given in the junior high schools.

In summary, the following points appear to be evident:

1. There is a shortage of qualified workers in the visual communications field which includes Letter Press Printing, Offset Printing, Newspaper Production, Duplication and various related fields including Photographic Plate Making, Color Reproduction and Lithography.

2. At least four national organizations are promoting expansion and development in the visual communications field. These are: The International Typographers Union, the National Association of Litho Clubs, The Printing Industries and the National Graphic Arts Association. All these are interested in widening the base for training in this field and in improving the quality, the quantity and extent of instruction available to youth and adults in the graphic arts industry.

3. Automation of the printing industry does not decrease the number of people employed. On the contrary, the tendency is to increase the number of workers in the field but to change the nature of their occupations. Visual communication is a rapidly changing and expanding industry and needs an extensive and organized program of development to increase the input of employable persons.

4. The public schools are the most fertile area for the development of interest and education in this whole area. The various

opportunities extend from duplicating services, photography, and captive press operation to the highest types of commercial printing occupations. They extend from initial training and on-the-job assistance through apprenticeship into journeyman training and on into technical education and management. The entire industry is in support of more extended initial preparation for entry into these occupations.

Presentation to Printing Occupations Workshop
by

Fred W. Bittner
Printers, Incorporated, (Member, Utah House of Representatives)

TRAINING NEEDS FOR ENTRY EMPLOYMENT IN THE UTAH PRINTING INDUSTRY

Supplant Printing Courses with Graphic Communications Departments

We do not have a choice! Today, we either keep up with industrial advances-or we sink in the backwash.

Nationally, the authorities agree - our technology is outstripping the ability of individuals in the industry to keep abreast of the advances made with high speed production facilities. The time to act in Utah is NOW. You are some of the people who can bring about needed progress in the Graphic Communications field.

Graphic Arts/The Printing Industry/Visual Communications or any similar name you want to apply should be viewed by educators as a tool.

This TOOL should be integrated into the general curriculum FOR ALL STUDENTS, whether they intend to use it to communicate, use it to earn a living helping others communicate or, as citizens in our society, use it in understanding and appreciating the ability to communicate.

In many areas of education, local school administrators have thought of printing as just another trade subject. It is frequently regarded primarily as a place to put a student "who isn't getting along very well in his general studies". "This will keep him out of mischief!"

Some few school officials know that graphic communications technology also needs the brilliant student. Few know that there are greater opportunities for research, for the physicist, the chemist, the engineer, than in many of today's Glamour fields. Few know there are scholarships and graduate fellowships for advanced study available.

The local school administrator frequently looks to the local printers for guidance in how to set up courses, working on the theory that these are the employers of the prospective graduates. THIS IS USUALLY A GRAVE MISTAKE. MOST PRINTERS ARE THEMSELVES WONDERING WHICH WAY THEIR BUSINESS IS GOING TOMORROW. ONLY A FEW ARE TECHNOLOGICALLY OUT FRONT WHERE THEY CAN POINT THE WAY.

So rapidly is technology changing that by the time present students are graduated, there will be little demand for people who run obsolete equipment.

The Industry today can be compared to a huge iceberg. Most of it is out of sight.

Consider - inplant printing departments in most major plants in the country, consider thousands of letter shops, consider duplicating departments in most industrial plants of the nation, consider the paste-up departments in most major industries where Repro copy is prepared for printing by another department or a private printer, consider lithographic, gravure and letterpress operations which are run in conjunction with manufacturing and fabricating operations, consider the genealogy department of the prominent church in this area,...if the people employed in these areas are not in the printing industry, it is safe to say there are more printers outside of the printing industry than inside. These are the needs - The jobs are going begging.

With this in mind, and by enlarging the above mentioned background, and then looking at our present school situation and the fast changing nature of the printing industry, ---what should we do about teaching the Graphic Arts in our schools of the State. There are two general aspects we must consider:

1. The over-all concept of graphic-communication education and how it fits into the total school curriculum

2. The more specialized problem of how we should be teaching in the area of printing technology

Let us consider the first aspect:

Start in the elementary grades - symbols, alphabets, pictures, drawings, they all communicate----words, language, creative writing, drawing, learning to "SEE" pictures---learning to convey ideas with these tools. Some parts of this are already present in current school programs. The communication concept can add to the purpose and the relation.

In the junior high and high school levels the technique of extending the prepared communication to many, many more people by the various printing techniques can be expanded upon. And - this is not just for those who might be interested in Graphic Arts as a career. It is for those who will participate in our society and must learn to communicate, whatever their role in life - as teacher, civil administrators, businessmen, scientists, clergymen, secretaries, and on and on, and on.

This form of communication in your curriculum involves a creative writing tie with the English Department. It involves a design graphic tie with the art department. It involves photography through formal courses, or through camera club activities. All demand graphic communication skill including the ability to type. They involve design, layout and pasteup procedures, camera and darkroom work.

Some wise teachers motivate students toward improving their ENGLISH and their MATH grades by emphasizing how essential these and other courses are to full success in the new age of Graphic Arts.

Now the second problem - teaching printing technology!

Except in a very few instances - Printing Technology should not and must not be a "SHOP COURSE" that is unrelated to other school subjects.

It must be part of a graphic communications department and laboratory. The function of this department should be to draw together the contributary learning from throughout the school curriculum and teach how it is purposefully applied to communications through visual graphic methods and reproduction techniques. The student should learn to assemble the pieces into one effective original... and then...make many more like it for distribution if necessary.

In the specific area of mechanical operations, the chief method of teaching printing in the schools should be by pasteup assembly of cold type, phototype, line drawings, photographs and artwork. This should be reproduced by photomechanical platemaking and lithography. The TWO PRIMARY reproduction tools in the entire department should be the camera with its darkroom and the litho press. Hand type and lever presses should be used for introductory and historical purposes only. The california job case and the justification of a line of hand set type, in my opinion is a waste of time.

Composition has to be produced. Cold type...IBM typewriters with proportional spacing, changeable FONT machines, even regular typing... headline and display photolettering devices are inexpensive and readily available. Sheets containing printed letters on paper or transparent material offer an inexpensive opportunity when you consider the variety of faces available.

Why Lithography? It enables the student to grasp the full scope of modern, economical graphic reproduction methods, including the easy use of photographs and the flexible freedom of layout. And... it teaches the use of the primary Graphic Arts Tool, the CAMERA. If we are going to teach today's methods to tomorrow's workers the camera should be the primary tool in the Graphic Arts printing courses in our schools.

The valuable experience of the present teachers should be used and he should be assisted in updating his present knowledge for today's conditions. He must be kept in constant touch with all of the new developments coming forth from suppliers. The educators of our industry have the awesome job of preparing men to cope with the technological developments of the age. Printing itself is an ART and must be taught and developed accordingly.

In the classroom and the Lab The Franklin Printing and Offset Catalogs can be used to great advantage in teaching Paper, Imposition, Estimating, and they contain a wealth of basic knowledge and reference material. Plant tours by Instructors are a MUST - Ink manufacturers, Paper Mills, Machinery suppliers welcome your interest and your visit. Second choice would be to be on every mailing list...and you'll get bundles of mail... but you will also receive a wealth of information - priceless in some instances and all very informative.

Acquaint yourselves with the major schools across the country. And the Courses they are teaching. Avoid the idea with your students that College is a Must. A Magazine like Fortune is a college education...just read the Advertising!

Instructors must be curious about the Industry. The Specialties, The Sidelines, the Publishing Industry, Direct Mail, Posters, Labels, Magazine Industry, Government Printing, Maps, Selling. You instructors have to be curious as to the HOW! Leadership in Visual Communication is unlike Steel or Autos, and yet Printing is one of the top 10 industries any way you care to measure it. Its product is all custom made.